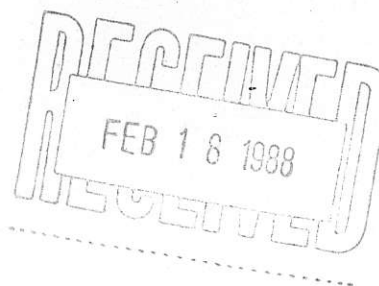


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A PRE-FEASIBILITY REPORT
ON THE QUESNEL RIVER PROPERTY

JUNE, 1987
ISSUED NOV. 25, 1987

DOMESTIC MINES GROUP
MINE DEVELOPMENT
DEPARTMENT

SUMMARY REPORT
ON THE PRE-FEASIBILITY
OF THE
QUESNEL RIVER PROPERTY

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1.0 INTRODUCTION

The Quesnel River property is located 60 kilometers southeast of Quesnel in the interior plateau country of Central British Columbia. [Figure 1]

The property is wholly owned by Dome Exploration (Canada) Limited, however, a 5% net profit interest is held by Peter Fox and Orbex Ltd.

The initial discovery was made as a result of a regional reconnaissance program in 1977. Since that time two additional deposits have been discovered and several promising targets still exist.

A preliminary mineral inventory and "quick-and-dirty" estimates of potential profitability led up to a site visit on March 31, 1987. Following this, a meeting was held with representatives from the various B.C. government agencies, on April 1, 1987. It was decided that the property did warrant a pre-prefeasibility type analysis. A seven week program was outlined, reserves were re-calculated and compared to previous studies.

reserve calculation back up is filed with Mine Development Department of Dome Mines Group.

2.0 SUMMARY OF RESULTS AND

2.1 General Overview

The estimated "mineable" and diluted reserve for the Quesnel River Property presently stands as follows:

	<u>Diluted Tonnes</u>	<u>g/t</u>
Main Zone Open Pit	526,445 <i>519,089</i>	5.86 <i>.17</i>
West Zone	108,403	9.36
Midwest Zone	<u>382,253</u>	<u>5.96</u>
Total	<u>1,017,111</u> <i>1,118,822</i>	<u>6.27</u> <i>-18</i> <i>1/29</i>

290,217 - 4.2

319,239 - .12

38,883 03

201,387 03

what factor?

In addition, 290,217 undiluted tonnes grading 4.6 g/t (uncut) 4.20 (cut), of potential reserves, including isolated blocks exists adjacent to the open pit.

The structural and geochemical complexity of the property has resulted in a variation in the geometry of each deposit. It is proposed that the Main Zone be mined by open pit, the Midwest Zone be mined by cut and fill and the West Zone be mined by room and pillar methods. The West Zone will be accessed by an adit [Figure 2] while the Midwest Zone will be accessed by a decline which will be partially completed during the bulk sample program. [Figure 3]. The total anticipated mill rate will be 400 TPCD with production commencing from the Main Zone pit and finishing with the exhaustion of the Midwest Zone.

The property will be accessed by a 70km long road from Quesnel. Power will be provided by B.C. Hydro after upgrading 56km of existing line and constructing the last 10km of line from Morehead to the property.

A total workforce of approximately 90 employees will work at the mine. Their point of hire will be Quesnel. Mine start-up will commence 18 months after mobilization of the construction contractor. [Figure 4].

mill	5	oz/yr 26,280	x 450 =	11.8
Tails	1			
Road	1			
Power	1			
Mobile	3			
eg.				
mine	2			
Dev.				
	<u>13</u>			
Site Cost	2			
	<u>15</u>			
		mini op 10	Cost	4.4
		mill op 20		7.4
		<u>30</u>		
		Ann op profit =		
				2-year payback
		<u>15 + 10% = 16.5mm</u>		

4.0 GEOLOGY AND RESERVES

4.1 General

The Quesnel River property is situated near the eastern edge of the Intermontane Belt in a northwesterly - trending assemblage of Upper Triassic - Lower Jurassic volcanic rocks referred to as the Quesnel Trough. This trough forms part of a volcanic belt that stretches from the 49 degrees N latitude to 57 degrees N latitude.

4.2 Deposit Geology

A dioritic/monzodioritic stock and related hornblende porphyry dykes and sills intrude and alter a package of sediments and volcanic extrusives. The country rocks have been propylitized containing variable amounts of pyrite, chlorite and epidote. The deposits have been cut by steep dipping north/south striking normal faults with minor strike slip displacement and a later set of NW striking reverse faults which dip 25-30 degrees to the southwest.

Gold generally occurs as finely disseminated micro-sized particles along pyrite and chalcopyrite grain boundaries. The gold to silver ratio is 1:1. The most consistent and best gold grades occur within 50 metres of the alteration front.

The Main Zone ore deposit strikes roughly E/W, dips at 45 degrees to the north and appears to plunge to the east at 40 - 70 degrees. It is cut off to the east and down dip by a reverse fault known as Wally's fault. It is also disrupted by several steeply dipping N/S striking faults. (?) This ore deposit dips in an opposite direction to that of the lithologies.

The West Zone strikes NW/SE and dips to the west at approximately 10 degrees. The deposit is usually situated within propylitic volcanics adjacent to a siltstone contact and unlike the Main Zone is therefore conformable to bedding.

The trend of the deposit is interrupted near its northern most limit by a crosscutting synformal feature. As a result of the north limb of this synform and the deposit has been eroded away. To the south it is "beheaded" by the Quesnel River Bluff.

The Midwest Zone is geographically situated to the west of the Main Zone. It strikes E/W, as does the Main Zone, dips 50 degrees to the south and plunges 40 degrees to the west, unlike the Main Zone.

The reasons for the variation in the geometry of these three deposits is not completely understood at this time. Their respective locations can be seen on the Site Plan. (FIGURE 5)

4.3 Reserves

The present hypothesis of gold implantment is that gold mineralization, although probably related to the intrusive event, is not stratigraphically or structurally controlled. This coupled with the present lack of visual control makes correlation from diamond drilling a tenuous proposition. As a result an unbiased "statistical" method of blocking out tonnage was used. All reserves have been placed in the "drill indicated" category, no attempt has been made to classify reserves into probable and possible as a result of the aforementioned geological caveats and a lack of outcrop exposure.

It should be noted, however, that the undiluted reserve estimate completed by Mr. J. Plaxton, P. Eng., for the Main and West Zones was confirmed within acceptable limits by the Mine Development Department's April 24, 1987 calculation summarized in Table 1. In addition the Mine Development Department have tabulated a reserve estimate for the Midwest Zone.

Total "mineable" uncut and diluted reserves for the Quesnel River Property presently stands as follows:

	<u>Diluted Tonnes</u>	<u>g/t</u>
Main Zone (1.5 g/t cut off)	526,445	5.86
West Zone (3.9 g/t cut off)	108,403	9.36
Midwest Zone (3.0 g/t cut off)	<u>382,253</u>	<u>5.96</u>
Total	<u>1,017,111</u>	<u>6.27</u>

In addition 290,217 undiluted tonnes of potential reserve grading 4.60 g/t (uncut) 4.20 (cut) exists adjacent to the open pit.

5.0 POSSIBLE EXPLORATION AND BULK SAMPLE PROGRAM

A three phased exploration and bulk sample program costing a total of \$4.6 million (escalated) has been outlined. Progression to the second and third phases of exploration will be contingent on the success of the preceeding phase.

Phase 1 consists of 8,300m of "fill-in and step-out" surface diamond drilling on the Main and Midwest Zones. The objectives of this phase are to both substantiate and expand our present drill indicated reserves and provide the level of detail required to optimize the grade of these deposits. The phase would cost \$709,000 to complete.

Phase 2 would involve more detailed fill-in surface diamond drilling on the Main Zone and a detailed underground drilling, mapping and bulk sampling program on the Midwest Zone. In total approximately 725m of ramping, drifting and crosscutting, and 3,800m of underground and surface diamond drilling will be completed. In addition 3,500 tonnes of ore will be crushed and sampled. The objectives of this program will be to obtain information relating to:

- a) geometry and continuity
- b) grade and grade variability
- c) mining method and expected mining dilution
- d) milling characteristics
- e) relationship between diamond drill indicated reserves and bulk sampling results.

This phase would cost \$2,448,000 to complete.

Phase 3 would entail ramping, drifting, cross-cutting, slashing and underground diamond drilling on the Main Zone. This phase of the program will act as a check on the continuity and grade of the Main Zone before making a final commitment to the project. The underground diamond drilling will be directed at upgrading the 290,217 tonnes of potential reserves into the possible or probable category. With approximately 550m of underground development, a 5000 tonne bulk sample and 1,000m of underground diamond drilling planned the cost of this phase is estimated at \$1,440,000. In addition, \$250,000 will be required to complete a final feasibility if the results warrant it.

2

6.0 MINE PLAN

Mining will commence via open pit from the Main Zone. In this area, overburden depth averages 7 metres. Stripping will take place during pre-production with overburden slopes being excavated at 2.5 horizontal to 1 vertical. Since no rock mechanics analysis have been performed, overall pit slopes are assumed at 45 degrees. The pit will be mined in 8m benches leaving a berm on the final wall every second bench. The ramp grade will be 10 percent. The total waste to ore ratio is 4.71 to 1 with the rock to ore ratio being 3.87 to 1. Pit reserves of 526,500 tonnes will yield just under a 4 year pit life. Waste rock and overburden will be used to construct a tailings dam north of the mine site. (FIGURE 5)

The following is a list of the major pit equipment required for mine operations:

<u>Item</u>	<u>Number Required</u>
Blasthole Drill	1
Airtrack Drill	1
Dozer	2
35 Ton Haulage Truck	3
8 yd. Loader	1
4 yd. Shovel	1
Mobile Rock Breaker	1
Road Grader	1

During the latter stages of pit life mine development will commence on the West Zone. Once the pit has been mined down to its bottom level at the 940m elevation (85m below surface including an 8m "rob cut") mill feed will be extracted from the West Zone and the Midwest Zone mine development will commence.

The relatively flat dip of the West Zone and the high relief of the Quesnel Property; lend well to room and pillar mining and adit access. A minimum mining width of 2.5m is anticipated and 80% mining extraction has been assumed with lower grade areas remaining as pillars. The sequence of mining will commence with a drift in ore for the complete strike length of the deposit followed by retreat mining back to the portal.

The following is a list of major underground equipment required for the West Zone Mine.

<u>Item</u>	<u>Number Required</u>
2 Boom Jumbo Drill	2
3.5 yd. Scoop Tram	2
13.5 ton Trucks	3
Grader (used)	1
Scissor Lift (used)	1
Jacklegs and Stopers	10

Mining of the Midwest Zone will commence on approximately the 895m elevation using a mechanized cut and fill mining method. Muck will be hauled to surface in 13.5 ton trucks. The major mining equipment required for this mine will be the same equipment used in the West Zone. Mechanized cut and fill was the chosen mining method because the dip of the deposit is very close to the angle of repose and therefore too shallow for blasthole mining.

Underground mining of the West and Midwest Zones will proceed for a total of just under 3 years yielding a total mine life of just under 7 years.

7.0 METALLURGY

7.1 Summary of Results from Head Samples

Preliminary test work on a composited sample of D.D.H. core from the Main Zone was done at Lakefield Research in 1981. The specific gravity of the head sample was determined as 3.19. The complete chemical analysis are listed below.

Au	5.71 g/t	Al O	12.3%
Ag	3.79 g/t	CaO	16.5%
Cu	0.11%	MgO	3.93%
Pb	0.003%	Na O	0.91%
Zn	0.005%	K O	1.53%
Fe	11.6%	As	0.005%
S	4.87%	Hg	0.0008%
SiO	35.6%		

The calculated gold head assay from 30 tests of this investigation was 4.69 g/t Au.

The tests have shown the Quesnel Main Zone to be a free milling ore. About 50 percent of the gold could be recovered by some form of gravity separation.

Straight cyanidation gave residues of 0.16-0.26 g/tAu, which, based on 5 g/t heads, would indicate recovery of 95 - 96 percent. Cyanide consumption is reasonable at 0.5 kg/t and could be reduced further by pre-aeration.

Floating a rougher concentrate of 25% weight, gave a flotation tailing as low as 0.13 g/t Au, with cyanidation of rougher concentrate giving overall gold recoveries of 93-95 percent. Cyanide consumption figures were 0.7-1.3 k/t of ore treated, a figure which reflects the higher copper and sulphide content of the concentrate.

Cleaning the flotation concentrate to reduce the weight to 10% of feed, resulted in some loss of gold in cleaner tailings.

On the basis of this preliminary testwork a straight cyanidation circuit would be selected. Indicated recovery is assumed to be 94 percent on heads of 5 g/t.

Due to the location of the deposit and the high sulphide and copper content of the ore an adequate allowance for effluent treatment should be made.

8.0 INFRASTRUCTURE

8.1 Property Access

The property is presently accessible by a 70km long logging road from the town of Quesnel. (FIGURE 1) The last 10km will require improvement prior to a bulk sample program. It has been assumed that the complete road will be re-surfaced during the construction phase. There is a possibility that the cost of road upgrading may be partially funded by the provincial government, however, this has not been assumed in this study.

8.2 Power

Power supply for the mine, mill and site facilities will be provided by B.C. Hydro. Fifty-six km of existing single phase power line will be upgraded to a three phase line. The last 10km from Morehead to the property, including a section over the Quesnel River, will be constructed.

8.3 Backfill

Provisions have been made for a backfill system for the Midwest Zone that will incorporate both screened sand and rock fill. Both types of fill storage will be stored on surface after excavation from the pit.

8.4 Waste Water Management

A natural swampy depression approximately 200m north of the mill will serve as the tailings dump, rock dump and overburden dump. A waste water management system, which incorporates tailings disposal and reclaim water for the process, will be provided. Provisions have been made for an effluent treatment plant and both primary and secondary polishing ponds.

8.5 Water Supply

Process water for the mine, mill and surface facilities is to come from a small lake 1.6km north of the tailings area. The level of this lake will be raised, as required, through the construction of a dam at its outflow. Potable water will be obtained from drilled overburden wells, yet to be identified.

8.6 Plant Buildings

All buildings on site will be of the pre-engineered type design except for the offices which will be set up in ATCO type trailer units.

8.7 Miscellaneous

Other provisions for the site include the following:

- offices;
- a communication system capable of handling a fax unit;
- a fuel storage depot;
- a septic bed type sewage system; and
- explosive storage area.

9.0 SOCIO-ECONOMIC AND ENVIRONMENTAL IMPACT

The City of Quesnel provides most of the amenities of a major city including an airport with daily flights to Vancouver, several schools, a hospital and a wide range of entertainment and recreational facilities.

Of the 10,250 working persons living in Quesnel, 2,300 are employed in primary industries (agriculture, forestry, fishing, trapping and mining and construction). It is felt that they will provide the basis of an adequate work force for the approximately 90 positions that will be available at the Quesnel River Mine.

The mine complex will operate on a 3 shift per day, 7 day week schedule. Personnel will work 8 hours per shift. A townsite will not be established at the mine site.

It is expected that the employees will be primarily attracted from Quesnel, Williams Lake and Barkersville. The company will not provide a means of transportation to and from the mine site, Quesnel will be the official point of hire. A similar system has been successfully introduced at Mascot's Hedley Mine, with travel times of 45 minutes one way being similar in both operations.

The Quesnel Deposits are located at the top of a bluff overlooking the Quesnel River to the South. The site is environmentally sensitive since this river is known to contain salmon and support some recreational activity. In an effort to minimize the effect that the mine will have on the environment, a line of tree's will be maintained between the open pit and the bluff thereby making the operation less visible from the river. As was previously stated in Section 7.4, waste rock and overburden will be used to build a tailings pond thereby restricting all potential pollutants to one location. Mill water will be recirculated as much as possible. Overflow will be diluted in a swampy area NE of the plant site and by Maud Creek before entering the Quesnel River. Provisions have been made for effluent treatment in both the capital and operating costs.

MAY 11, 1987

TABLE # 1
COMPARISON OF UNDILUTED RESERVES
IN THE
MAIN & WEST ZONES

J.A. PLAXTON					MINE DEVELOPMENT (APRIL 21, 1987)					DIFFERENCE	
CRITERIA: - MIN. WIDTH 2.0 M - CUTTING FACTOR 30 gcs - BOTH STRIKE & DIP TAKEN @ 1/2 DISTANCE BETWEEN HOLES TO MAX. OF 15 ° - S.G. = 3.19					CRITERIA: - NO RESERVES CALCULATED FOR NORTH ZONE - CUTTING FACTOR 30 gcs - BOTH STRIKE & DIP TAKEN @ 1/2 DISTANCE BETWEEN HOLES TO MAX. OF 15 ° - S.G. = 3.19 MAIN - MIN. HORIZONTAL WIDTH 4.0 M WEST - MIN. MINE OPENING 2.5 M						
ZONE	CUT-OFF GRADE (gcs)	TONNES	GRADE (gcs)	TONNES X GRADE	ZONE	CUT-OFF GRADE (gcs)	TONNES	GRADE (gcs)	TONNES X GRADE	TONNES	GRADE (gcs)
MAIN & NORTH	3.0	437,043	7.388 (cut)	3,299,007	MAIN (only)	3.0	416,353	7.260 (cut)	3,020,945	20,690	0.128 (cut)
			8.643 (uncut)	3,777,254				8.350 (uncut)	3,476,085		0.293 (uncut)
	1.5	640,462	5.725 (cut)	3,666,575		1.5	633,400	5.510 (cut)	3,487,312	7,062	0.215 (cut)
			6.576 (uncut)	4,211,998				6.220 (uncut)	3,942,452		0.356 (uncut)
WEST	3.0	107,241	9.547 (cut)	1,023,821	WEST	3.0	123,185	8.420 (cut)	1,058,960	(15,944)	1.127 (cut)
			12.466 (uncut)	1,336,903				10.300 (uncut)	1,290,442		2.166 (uncut)
TOTAL	3.0	544,284	7.942 (cut)	4,322,828	TOTAL	3.0	539,538	7.56 (cut)	4,079,905	4,746	0.382 (cut)
			9.396 (uncut)	5,114,157				8.83 (uncut)	4,766,527		0.566 (uncut)
	1.5	747,703	6.273 (cut)	4,690,396		1.5	756,585	6.01 (cut)	4,546,272	(8,882)	0.263 (cut)
			7.421 (uncut)	5,548,901				6.92 (uncut)	5,232,894		0.501 (uncut)

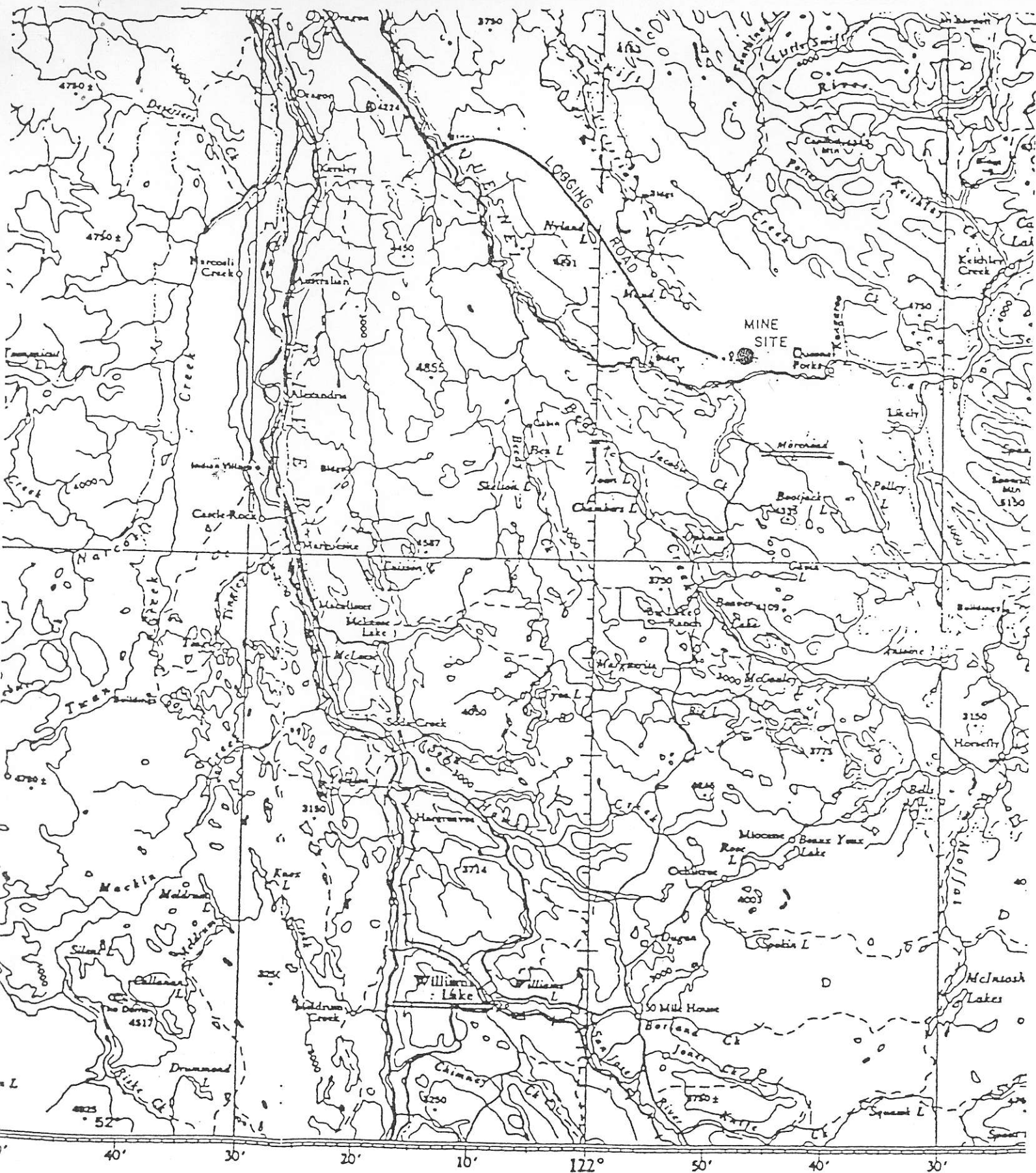


FIGURE 1

LOCATION MAP
QUESNEL MINE
SCALE 1:500,000

0 10Km

110+00 E

111+00 E

112+00 E

113+00 E



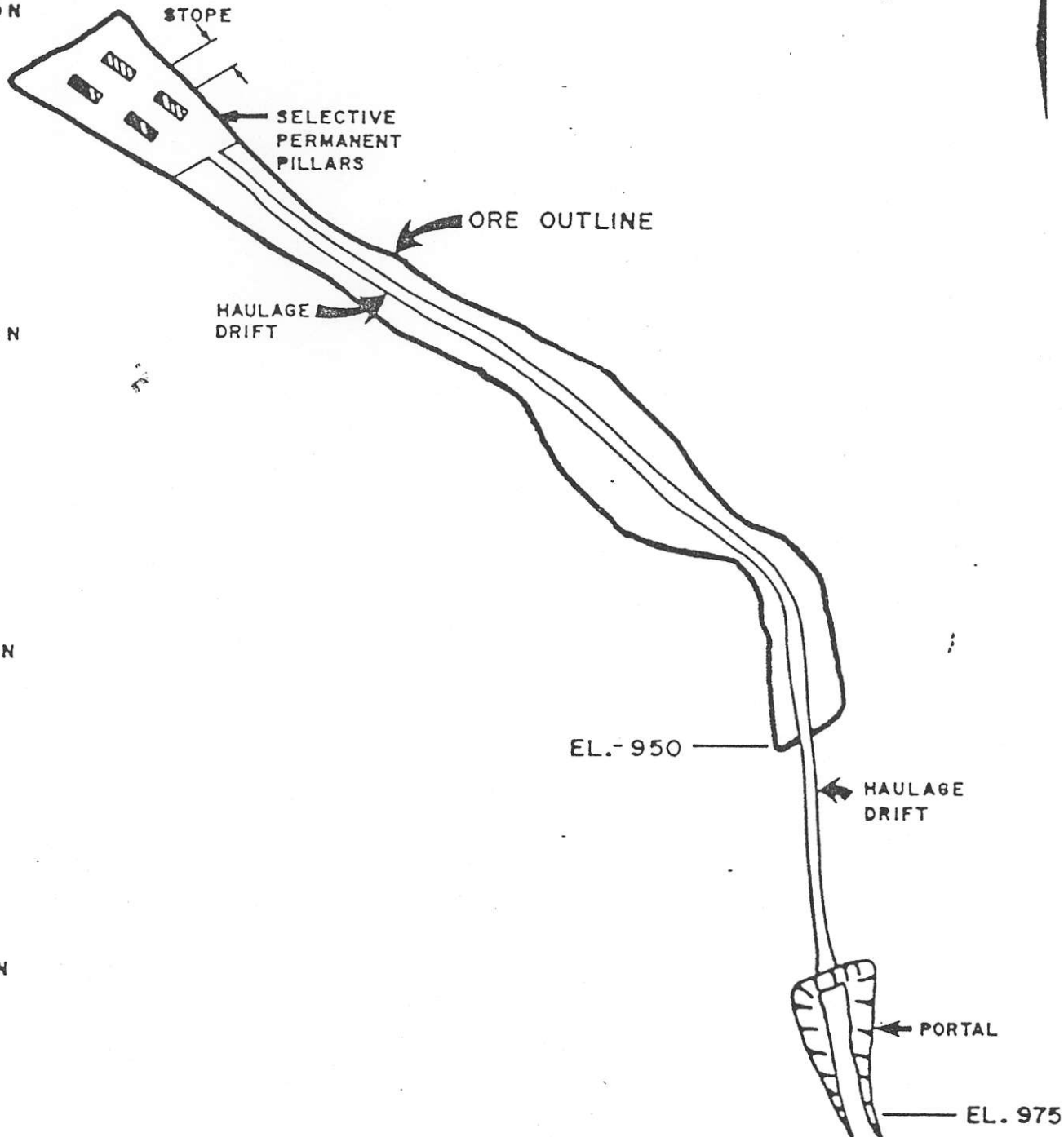
97+00 N

96+00 N

95+00 N

94+00 N

93+00 N



TITLE:

QUESNEL RIVER PROPERTY
PLAN SHOWING WEST ZONE

SCALE:
N.T.S

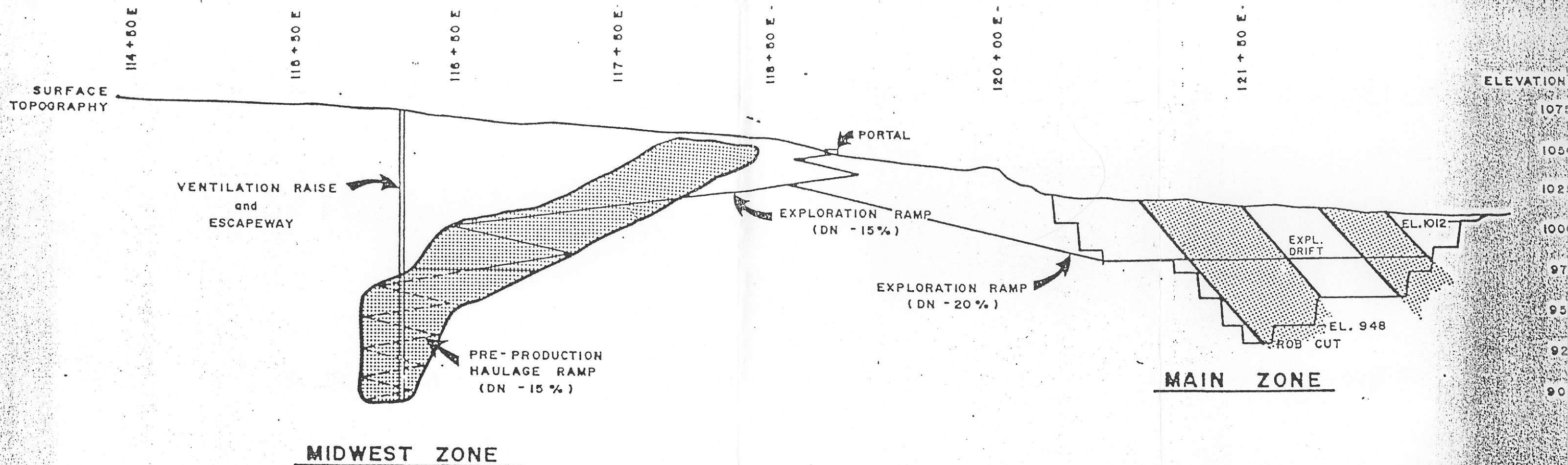
DR. BY:
R.C.

APPR:

DATE:
MAY 21/87

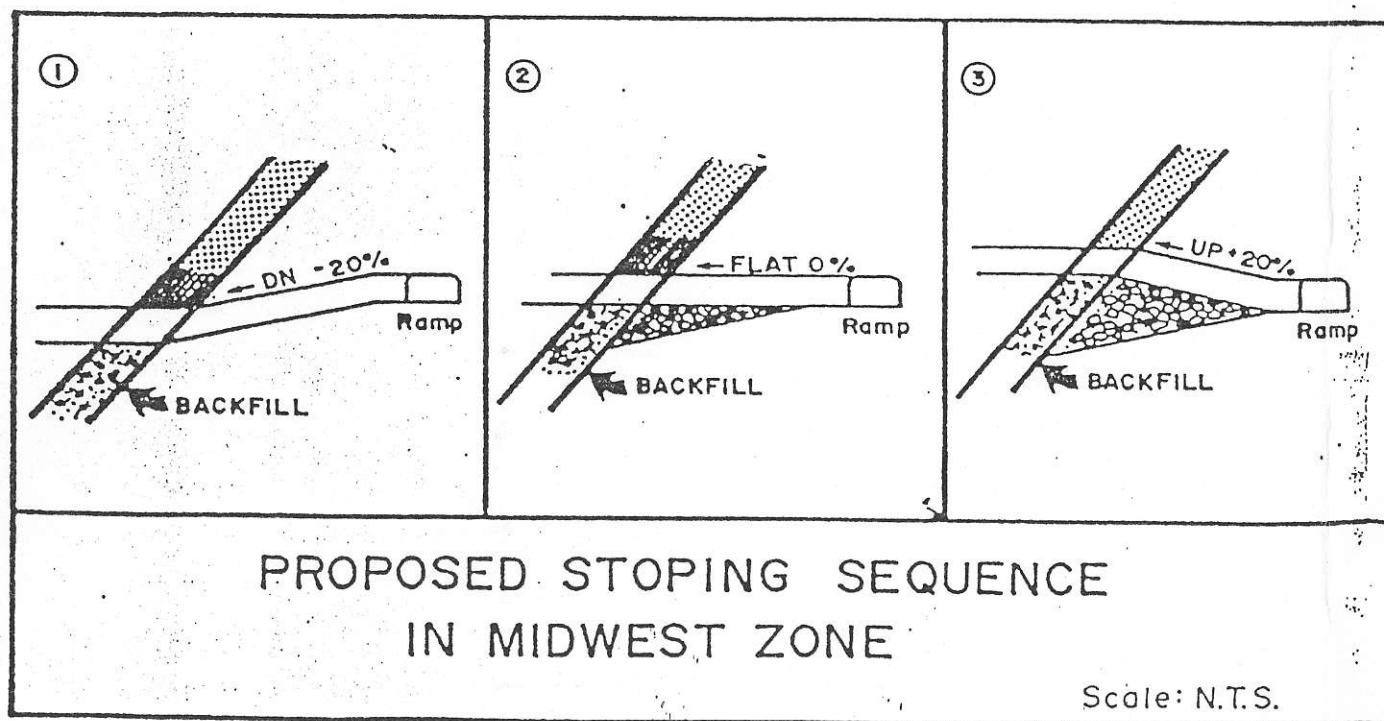
DWG. N°:
figure 2

DOMES MINES GROUP



LEGEND

- ORE ZONE



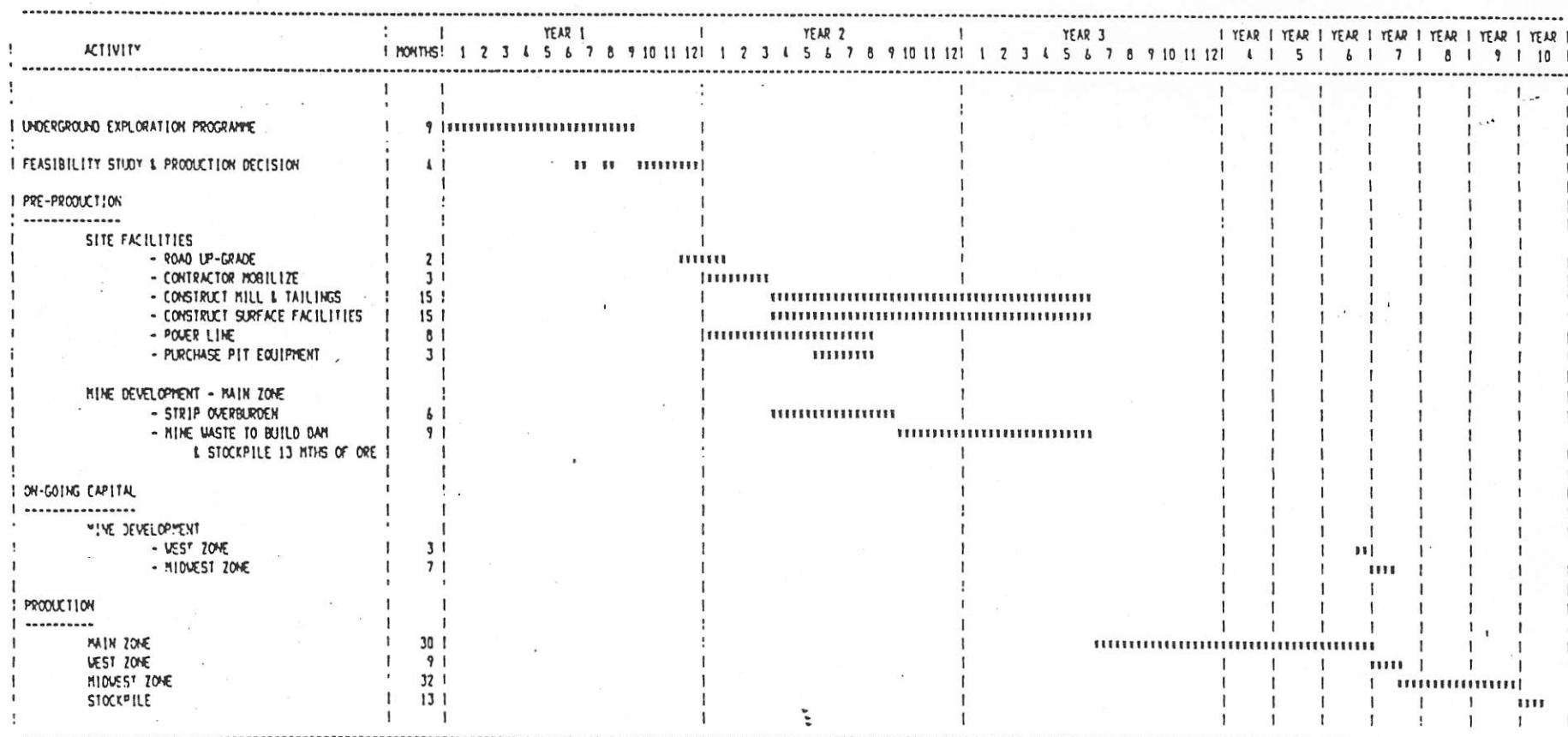
DOME MINES GROUP

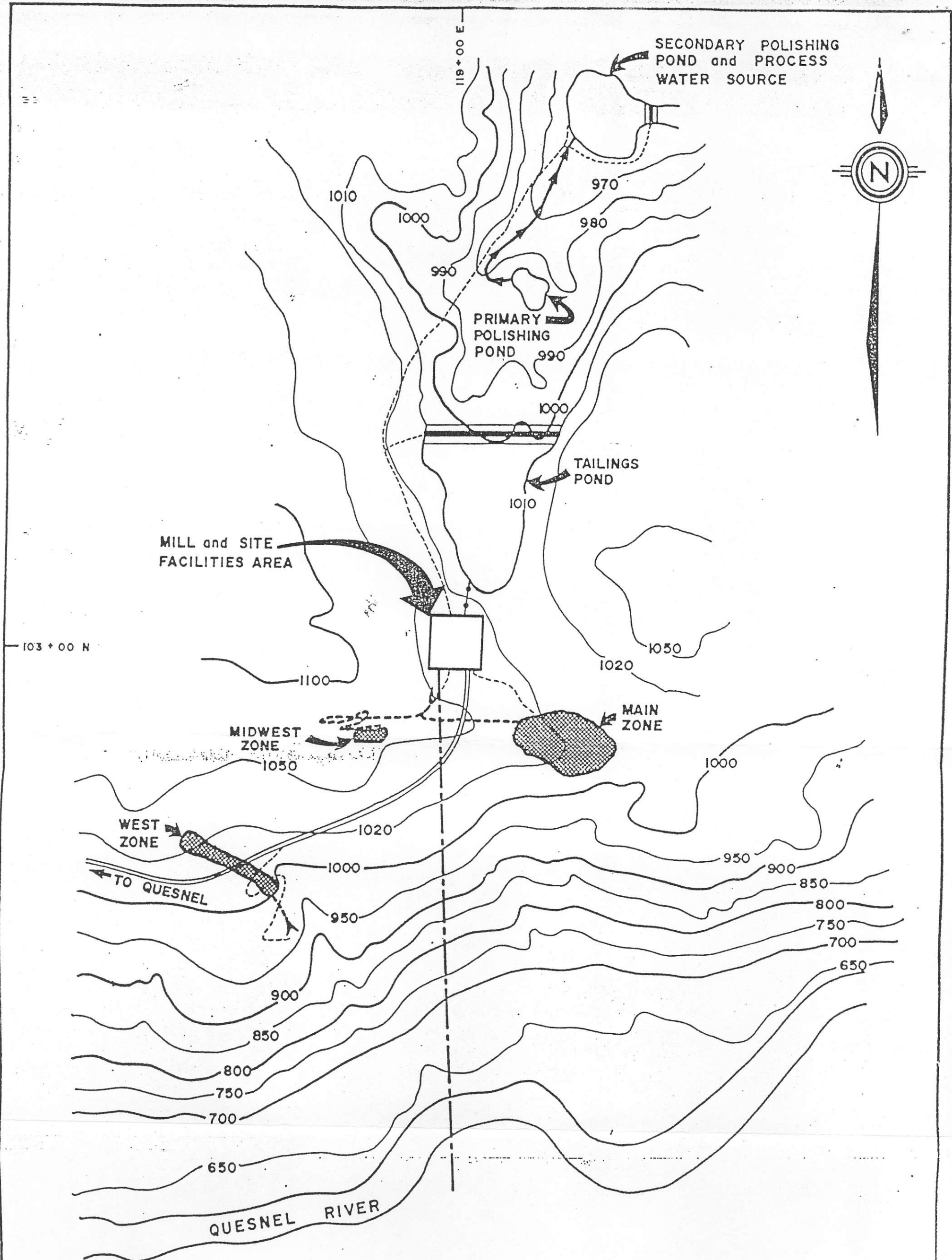
TITLE

QUESNEL RIVER PROPERTY
LONGITUDINAL SECTION SHOWING
MAIN and MIDWEST ZONES

SCALE: 1:2500	DRN. BY: R.C.	APPR. BY:	DATE: JUNE/87	DRNG. NO.: figure 3
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21.

[illegible]



LEGEND

- SITE ACCESS ROAD
- SITE ROAD
- PROPOSED UNDERGROUND DEVELOPMENT
- PORTAL
- CONTOUR LINES
- ORE ZONE
- TAILINGS LINE
- DRAINAGE DITCH
- DAM

DOMINE MINES GROUP

TITLE

QUESNEL RIVER PROPERTY
PROPOSED SITE PLAN

SCALE:

DRN. BY:

APPR. BY:

DATE:

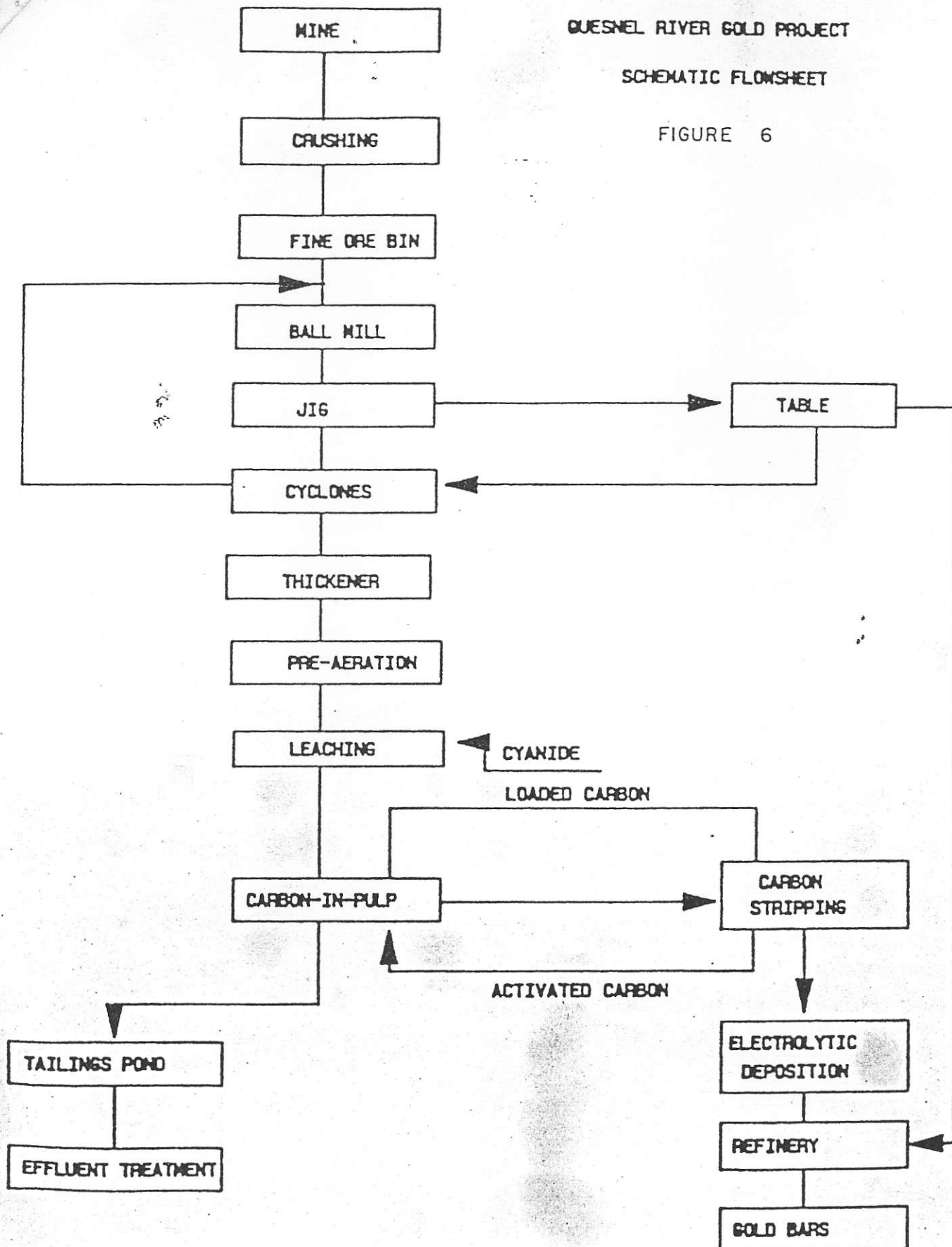
DRNG. NO.:

CLIQUE 5

QUESNEL RIVER GOLD PROJECT

SCHEMATIC FLOWSHEET

FIGURE 6



1) Calan Develops mine ~~and~~
~~achieve payback.~~

In \$15 MM. & earn 65%
int

Sells 5 MM shares for
an average price of
- \$3

2. Placer receives 35%
~~cash flow~~
~~net profit~~ interest in
the mine after payback.

(The mine property is
restricted to a few
claims around the
ore bodies)

3. Calnor buys ~~the~~ the
Vared property.

4. Placer Expenses
Vared and other Placer
Properties outside of
mine with a 50%
Bochin to Calnor
after \$20000

OK

\$3

Spent.

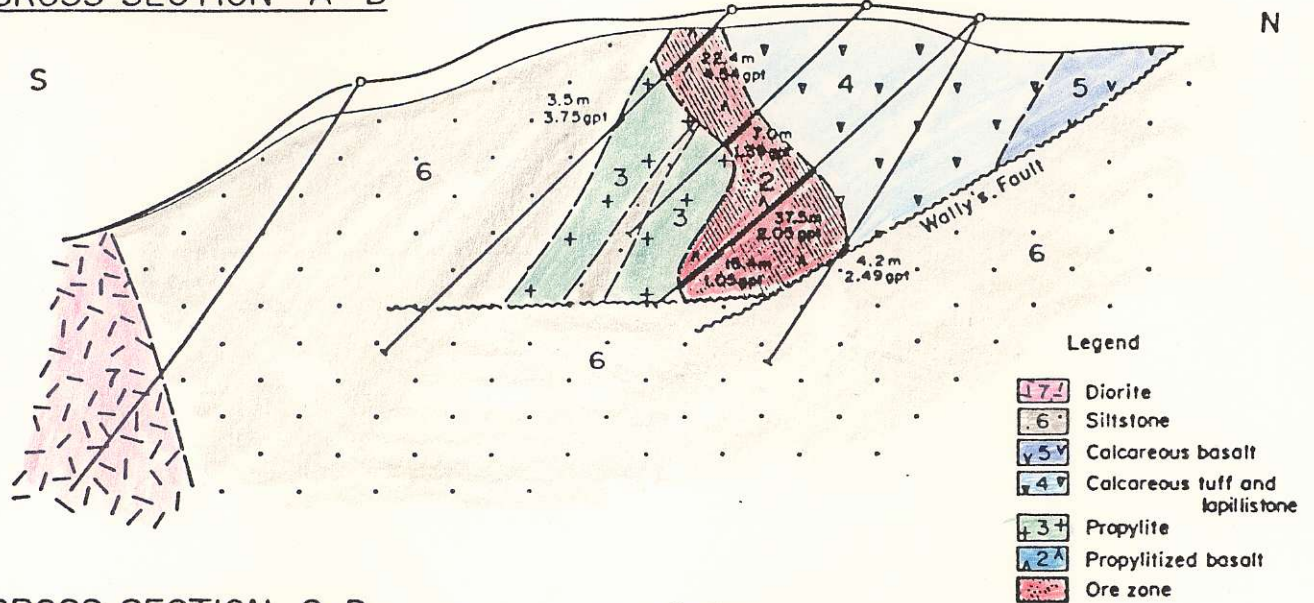
Calcn. \$500,000

issued

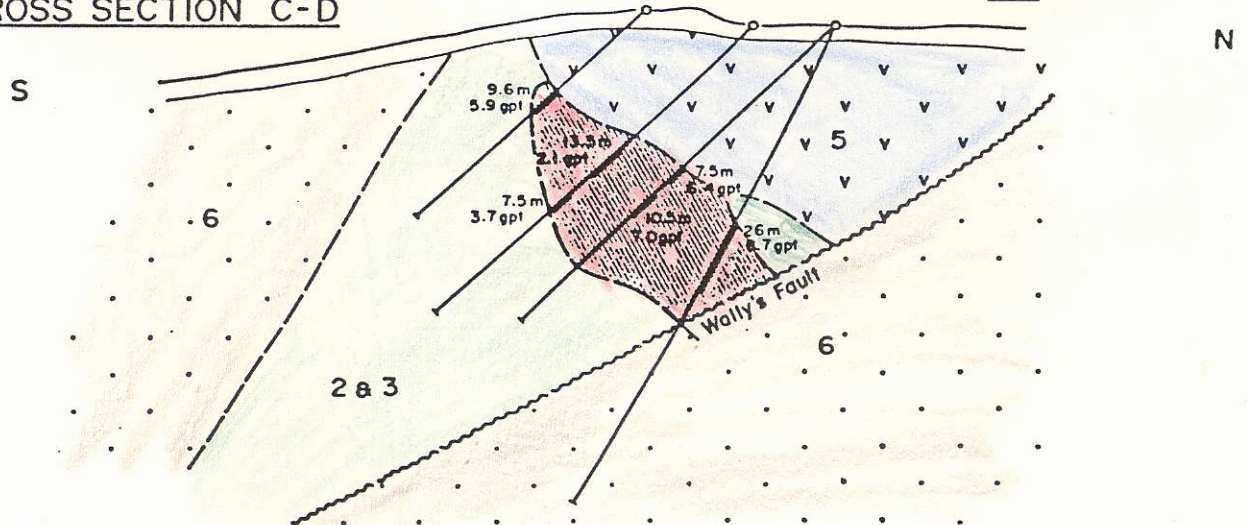
\$16.5

Figure 3

CROSS SECTION A-B



CROSS SECTION C-D



CROSS SECTION E-F

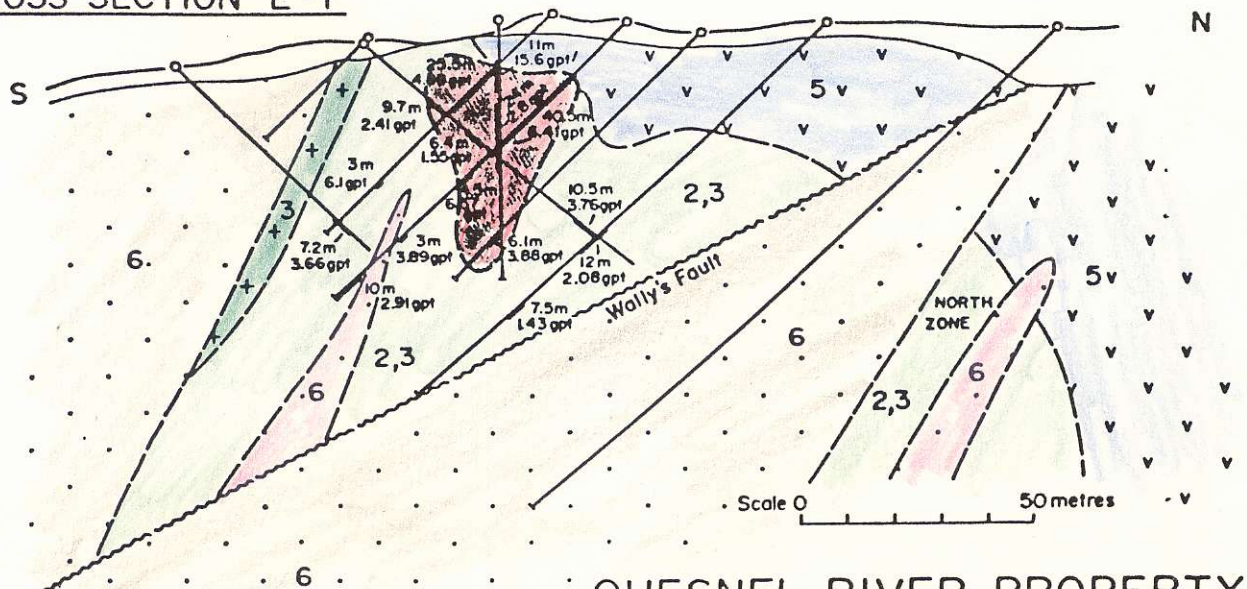
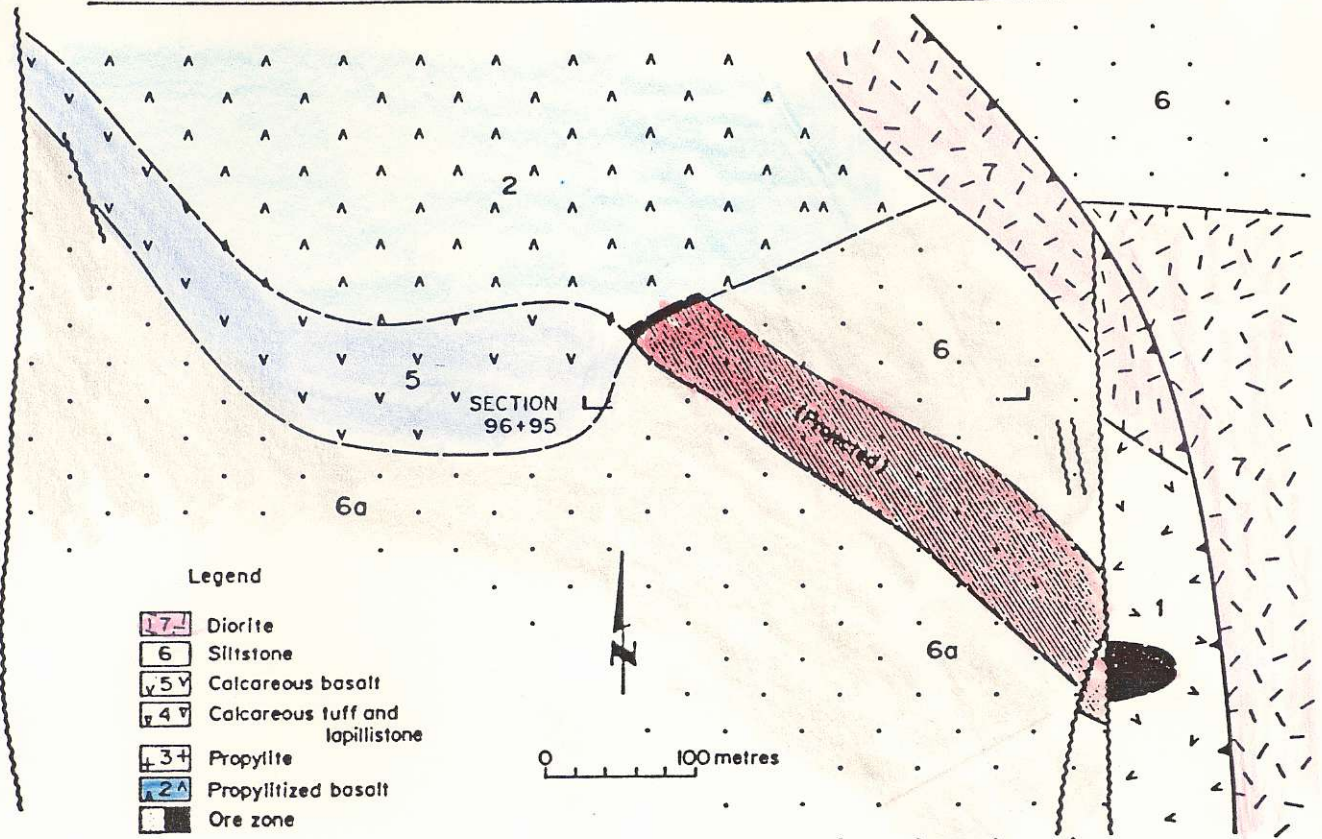


Figure 4

QUESNEL RIVER PROPERTY - WEST ZONE GEOLOGY



SECTION 96+95

